REMARKS

Claims 1, 6, 11, 16, 21, 25 were rejected under 35 U.S.C. 103(a) as being unpatentable over Carlson et al. (US Patent No. 4,523,230) in view of Okada et al. (US Patent No. 5,247,169) and Deering (US Patent No. 6,734,850). In the prior office action the same claims were rejected over Carlson et al. in view of Okada in view of Levine (US Patent No. 4,499,497). In the present office action, the examiner states: "It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate Okada et al. teaching into the Carlson et al. system in order to provide an image signal that causes no erroneous determination due to noise." The examiner cites Okada, Col 1, lines 62-64 in support of his obviousness determination.

Applicant provides below a quotation of the cited sentence in the Okada specification. This sentence was not reproduced in its entirety in the examiner's rejection. Okada states the following (emphasis mine) "An object of the invention is to provide an image signal that causes no erroneous determination due to **noise amplification**."

Applicant's claimed invention is not directed to ameliorating effects of noise amplification. Okada's teaching related to noise amplification (See Okada, col 6, lines 35-45 wherein is stated: "two amplifiers 8 and 9 are adjusted so output levels will be equal to each other..." and, "...low pass filters remove noise components from amplified image signals") would not work to reduce sparkle in an LCOS display. One of ordinary skill in the art would readily understand that incorporating the teaching of Okada into Carlson would not arrive at applicant's invention. On the contrary such a modification would most likely render applicant's invention, as well as Okada's and Carlson's circuits inoperative.

With respect to the teaching of Okada found in col. 3, lines 4-14, applicant notes Okada describes "delaying" an image signal that has **been picked up from parts of an object** (col. 3 line 8) step in order to determine the positional relation of one part of an illuminated object (highly reflective) to another part of an illuminated object (low reflective). This teaching has no meaning in the context of applicant's invention. While the term "delay" is used by Okada, the use is merely coincidental. What is being delayed in Okada is readily distinguishable by those of ordinary skill in the art from the subject of the delay step recited in applicant's claims. One of ordinary skill in the art would readily recognize that applying the teaching of Okada with respect to delay of signals obtained from different parts of an object to determine the relative position of the parts, would not have any effect to reduce sparkle if that kind of delay were applied to LCOS display circuits.

Further, one of ordinary skill in the art would not look for teachings related to reducing sparkle artifacts in Okada. Okada describes a light dividing means, and then only in the context of an optical subsystem. Optics is a non analogous art. The dividing means of the Okada reference is described by Okada (abstract) as follows: "A beam splitter divides light reflected by the surface of the object into two parts. Each of **the divided parts of the light is passed through an optical** filter whose transmission wavelength range is set according to the colors of the object, to adjust the quantity of transmitted light from a high-brightness part of the object surface and the quantity of transmitted light from a low-brightness part of the object surface to a reference level."

With respect to Deering, the office action states, "Deering teaches combined video signal to imager". However, even assuming, arguendo, Deering taught providing a combined video signal to an imager, Deering could not be combined with

Okada and Carlson to arrive at applicant's invention because neither Okada nor Carlson provide any teaching relating to applicants invention.

As to the remaining portions of the office action applicant believes the claims are allowable in view of the above argument. Applicant reiterates herein the arguments previously made regarding other cited references in prior office actions.

In rejecting independent claims 1, 11 and 21 the prior office action states Carlson et al. teaches a method for reducing sparkle artifacts in a liquid crystal imager (See Col. 13, Lines 46-50). With respect to claim 1, the office action states Carlson teaches the claimed method by teaching to apply a combined video signal (summer) to the imager reducing effects of orthogonal fields in adjacent pixels (sparkle in the Carlson et al. reference and in the preamble) of the imager (See Fig. 2a, Col. 8, Lines 24-62 and Col. 18, Lines 29-49).

Applicant notes for the record that Carlson lacks any teaching relating to reducing the effects of orthogonal fields in adjacent pixels. Carlson refers to "sparkle" only once in the cited reference. There, Carlson defines "sparkle" as a "spatial frequency artifact" arising from application of a specific filtering technique to a signal that has undergone wide band coring.

In contrast, the phenomena to which applicant refers, orthogonal fields in adjacent pixels, are an electromagnetic phenomena. These phenomena are not artifacts arising from the application of a particular signal processing technique.

Applicant further notes that Carlson lacks any teaching that "applying combined video signal (summer) to the imager" will reduce "sparkle". This teaching is lacking even if one adopts, arguendo, Carlson's definition of "sparkle".

Carlson's teachings relating to Carlson's "sparkle artifacts" are limited to suggesting the use of narrow band coring, instead of wide band coring, to suppress Carlson's "sparkle". Carlson lacks any suggestion that any other approach, or additional change to any apparatus or method could be used to suppress Carlson's "sparkle". Carlson is entirely silent on suppressing "sparkle" of the type defined in applicant's specification. And, there is no suggestion in Carlson, or in any other cited reference, to modify Carlson or any cited reference to arrive at applicant's claimed invention.

Applicant further notes that Carlson's disclosure is limited to operating on the incoming signal in a spatial frequency domain. The incoming signal is separated by a spectrum analyzer to provide a plurality of sub-spectra bands representing spatial frequencies. It is these subspectrum bands that are synthesized into a single output image representing signal. Therefore Carlson lacks any disclosure or teaching of any part of applicant's invention as recited in applicant's claims.

The prior office action recognizes Carlson et al. does not show step of dividing a video signal for a picture into a higher brightness level signal and lower brightness level signal, low pass filtering lower brightness level signal, delaying higher brightness level signal to match a processing delay incurred by low pass filtering.

However, the prior office action states Okada et al. teaches dividing a video signal for a picture into a higher brightness level signal and louver brightness level signal (column 2, lines 17-33), low pass filter (See Fig. 1, item 10-11) arrangement and a delay matching circuit (See Fig. 1, item 15 16, 18) are for independently low pass filtering rising transients and falling transients in low brightness signal to reduce adjacent pixel interdependence, and the delay matching

circuit for the high brightness signal (See Fig. 1-3, items 10-11, 15-16, 18, S7, Col. 7, lines 5-16 and Col. 3, Lines 4-13).

Applicant again respectfully disagrees for the following reasons. First there exists no teaching in Okada of "dividing a video signal for a picture into a higher brightness level signal and lower brightness level signal (column 2, lines 17-33)". Second, there is no teaching in Okada of "independently low pass filtering rising transients and falling transients in low brightness signal." Third, applicant's claims do not recite any feature of "independently low pass filtering rising transients and falling transients in low brightness signal".

With respect to applicant's claim 1 feature, " dividing a video signal for a picture into a higher brightness level signal and a lower brightness level signal ; the examiner errs in relying on Okada's disclosure of "means for dividing light" as teaching or suggesting applicant's features relating to dividing video signals. Okada describes a light dividing means, and then only in the context of an optical subsystem. Optics is a non analogous art. The dividing means of the Okada reference is described by Okada (abstract) as follows: "A beam splitter divides light reflected by the surface of the object into two parts. Each of the divided parts of the light is passed through an optical filter whose transmission wavelength range is set according to the colors of the object, to adjust the quantity of transmitted light from a high-brightness part of the object surface and the quantity of transmitted light from a low-brightness part of the object surface to a reference level."

The principles of engineering and physics applicable to dividing into light beams using beamsplitters, (the science of optics) are not applicable to the task of decomposing a video signal into video signal components. Okada lacks any teaching that the term "light" should be given any meaning other than its ordinarily understood meaning, that is "radiant

energy that is capable of exciting the retina" (The New IEEE Standard Dictionary of Electrical and Electronics Terms, The Institute of Electrical and Electronics Engineers, Inn, 1993, page 714.) The term "video signal" as commonly understood and as described in applicants specification, for example, in paragraph 32: "The video signal is a digital signal, and the waveform is a succession of digital samples representing brightness levels."

One of ordinary skill in the art would not be motivated to provide a video signal to an optical dividing means such as a beamsplitter so as to divide the video signal into high and low brightness level video signal components. Nor would one apply a beam splitter to a video signal prior to low pass filtering. One of ordinary skill in the art would not expect success in making such a combination. Therefore, there is no motivation to combine a teaching of an optical subsystem designed to divide visible light into light beams with any other reference to arrive at applicant's claimed invention.

Further, even considering arguendo, the teaching of Okada regarding dividing means to be analogous art, the examiner errs on this ground of rejection because no reference contains a teaching, suggestion or incentive which would have led one of ordinary skill in the art to modify or combine the optical light dividing subsystem of Okada with the teaching of Carlson, or of Levine to arrive at applicant's claimed invention. It would be technically impossible and non feasible to modify such an optical sub-system so that it could divide a video signal into components in any way, especially in a way that would meet the requirements of applicant's claims 1, 11 and 12. This fact, in and of itself, is a disincentive to the artisan to do so.

In addition, the purpose for which the Okada optical subsystem is intended (dividing light reflected from the surface of an object to be inspected)is not normally present

in the environment in which applicant's apparatus is operated. Therefore, the artisan would not have been motivated by Okada, Carlson, or any other reference, taken alone or in combination, to combine the light dividing features described in Okada with any another reference in such a manner as to meet the terms of applicant's claims reciting dividing video signals.

Further, the examiner again appears to rely on impermissible hindsight and applicant's own disclosure to interpret the reference as disclosing or suggesting "means for dividing a signal", when in fact the reference describes only "means for dividing light."

Further, in this context, the reference describes "brightness" solely as it relates to a high or low brightness part of an object surface. The examiner's conclusion that such a description of dividing light reflected from a high or low brightness part of an object surface teaches or suggests a decomposer for decomposing a video signal into high or low brightness level video signal components could only have been postulated using impermissible hindsight gleaned from reading applicant's specification describing "decomposing video signals" and "brightness level video signal components".

Contrary to the examiner's assertion in the office action, Okada does not teach that the low pass filters (10, 11) are for "independently low pass filtering rising transients and falling transients in said low brightness signal to reduce adjacent pixel interdependence". Such an interpretation of Okada contradicts the actual disclosure of Okada. Okada specifically describes the cited low pass filters illustrated at 10 and 11 are for filtering noise from amplified image signals A2 and B2. (See Okada col 4 lines 52 -59 ") In step S3, the low-pass filters 10 and 11 remove noise components from the amplified image signals A2 and B2 and provide image signals A3 and B3, respectively. ") There

is no mention in Okada of rising and falling transients, nor is there any discussion in Okada related to adjacent pixel interdependence. For that matter, there is no recitation of "rising and falling transients" in applicant's claims.

Further, applicant's claims recite a low pass filter that operates only on a low brightness level signal component of a video signal. The filters 10 and 11 of Okada, on the other hand, are applied to both of the amplified image signals A2 and B2. According to Okada (see, for example, Figure 1) the amplified image signals A2 and B2 taken together comprise the entire image signal to be processed. Thus, there is no disclosure in Okada of using low pass filters 10 and 11 to filter "only a lower brightness level signal component of a video signal." Further, Okada describes the light reflected from the object should be equalized before forming an image signal. See for example, Okada col. 2 lines 30-37. Okada states, "In this way, the quantities of the transmitted light from the high and low brightness parts of the object surface are equalized, and the image pick-up means simultaneously pick up the images of the high and low brightness parts of the object at the same positional relations and photoelectrically convert the images into electric image signals."

Okada further states amplifiers 8 and 9 are adjusted to have equal output signal levels. " In step S2, the object kind presetting unit PS controls amplification factors of the amplifiers 8 and 9 so that output signal levels of the amplifiers 8 and 9 will be equal to each other once the quantity of light from the white part of the capsule transmitted through the optical filter 4 and the quantity of light from the red part of the capsule transmitted through the optical filter 5 are adjusted to the reference level. Thus, Okada describes that image signals Al and BI are equal with respect to the high and low brightness parts of the

object. This teaching is in contradiction to applicant's claims.

The office action states it would have been obvious to one of ordinary skill in the art at the time of invention to incorporate Okada et al. teaching into the Carlson et al. system in order to provide an image signal that causes no erroneous determination due to noise (See Col.1, lines 62-64 in the Okada et al. reference).

Applicant respectfully disagrees because no modification of the Carlson system with the Okada beamsplitter for dividing light would result in applicant's claimed invention.

Accordingly, Applicants respectfully request the withdrawal of the rejections under 35 U.S.C. § 103(a) and allowance of the claims.

Applicant invites the Examiner to call the undersigned to clarify any issues raised herein.

Respectfully submitted,

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